March 1992

IRS PROCUREMENT

Software Documentation Requirement Did Not Restrict Competition

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The Honorable John Glenn
Chairman, Committee on
    Governmental Affairs
United States Senate

Dear Mr. Chairman:

This report responds to your office's request that we review the Internal
Revenue Service's (IRS) efforts to acquire the Check Handling
Enhancements and Expert System (CHEXS). CHEXS is an automated system
that is to be used by IRS to process tax remittances. It would replace IRS'
current tax remittance processing system, which dates from the 1970s.
Eleven CHEXS systems are to be acquired and installed at IRS headquarters
and service centers over a 7-year period at an estimated cost of $131
million. Our objectives were to determine if software documentation
requirements included in the request for proposals for CHEXS were
justified, and whether these requirements improperly restricted
competition. Details of our objectives, scope, and methodology appear in
appendix I.

Results in Brief

IRS' software documentation requirements for CHEXS were justified and did
not improperly restrict competition. IRS has a sound basis for requiring
that all software it expects to maintain, including both pre-existing and
off-the-shelf software, be documented in accordance with its internal
standard. We agree with the agency that it is much easier for its
programmers to maintain software that is documented according to a
single agencywide standard. However, we found that IRS has not been
explicit in stating this requirement in other requests for proposals.
Problems with future procurements could arise if this requirement is left
unclear.

Background

Each year, IRS service centers receive millions of tax documents, such as
tax returns, estimated tax payment vouchers, and federal tax deposits, that
are accompanied by checks and money orders. IRS' current system for
processing these documents and remittances requires frequent rehandling
of documents and duplicate key entry of data, and it cannot process about
15 percent of all remittance transactions. CHEXS would replace the current
system. The objectives of CHEXS are to use modern hardware and software

and imaging technology to process 100 percent of remittance transactions, reduce paper handling and key entry, and decrease deposit discrepancies.

The request for proposals for CHEXS was released to vendors in September 1989. Technical proposals were due in May 1990, followed by price proposals in June 1990. The CHEXS contract was to have been awarded in September 1991. However, the award has been delayed because there have been significant changes in IRS' remittance processing requirements. For example, IRS now expects that a tear-off payment voucher system for processing tax remittances will be used to a much greater extent than had been anticipated when the requirements for CHEXS were approved.[1] As a result, the requirements in the request for proposals were no longer valid. On January 28, 1992, IRS placed a notice in the Commerce Business Daily announcing its intention to amend the request for proposals to reflect the changed requirements. IRS' plans were to evaluate vendor reaction to the notice, then either amend the current request for proposals or reopen competition by issuing a new request for proposals. As of February 12, 1992, this decision had not been made.

IRS Clarified Its Software Documentation Requirement in Response to a Vendor's Question

As originally issued in September 1989, the CHEXS request for proposals required that software specifically developed for CHEXS be documented in conformance with Internal Revenue Manual (IRM) 2500, ADP Software Standards and Guidelines. On March 6, 1990, a vendor asked IRS whether this software documentation requirement also applied to commercial off-the-shelf and pre-existing software. IRS subsequently found that although IRM 2500 prescribes standardized documentation for any application software that IRS programmers would be responsible for maintaining, the request for proposals required standard documentation for only specially developed CHEXS programs. To achieve consistency between the request for proposals and IRM 2500, on April 20, 1990, about 1 month before proposals were due, IRS amended the request for proposals to require that all application software for which IRS might assume maintenance responsibility be documented in accordance with IRM 2500. The amendment specifically stated that all documentation of pre-existing software that will be maintained by IRS be in conformance with IRM 2500.

After IRS clarified this requirement, another vendor (who did not raise the question) withdrew from competition for CHEXS. This vendor had planned

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[1]Under this system, tax returns will include a stub that will be torn off in the mail room of the IRS service center, attached to the remittance (check or money order), and entered into CHEXS for remittance processing. This involves less paper handling than the current remittance processing system, which requires that the entire return accompany the remittance for processing.

to provide commercial, off-the-shelf software in the proposal for CHEXS. This vendor complained to IRS that IRM 2500 (1) is a standard that should be applied only to software under development, not pre-existing or commercial software and (2) requires conformance with one particular documentation methodology (known as the Yourdon, Constantine, and DeMarco method). According to the vendor, it had already spent over $1 million developing its proposal, and would be forced to spend an additional $2 million to document its software to comply with IRM 2500. The vendor asserted that the requirement that all software comply with IRM 2500 restricted competition for the CHEXS procurement because it changed the solicitation from one focusing on an off-the-shelf solution to one focusing on a specially developed solution. According to the vendor, it elected not to file an official protest of the request for proposals because it is not a "protesting company."[2]

IRS Documentation Requirement Conforms to Federal Information Processing Standards

The Internal Revenue Manual states that all software and documentation developed specifically for the IRS must be in conformance with IRM 2500. The standard is not intended to apply to commercial software packages such as Wordperfect, Lotus 1-2-3, and Oracle that will not be maintained by IRS. Our review of IRM 2500 showed that it conforms with generally accepted system development methodologies as described in Federal Information Processing Standards publications (FIPS PUBS).[3] IRM 2500 and FIPS PUBS number 38, 64, and 105 require that software be developed and documented in accordance with a uniform, phased approach to systems development. This approach prescribes the use of standard systems documentation for technical products such as logical and physical data base specifications, user manuals, system description, data specifications, and computer program listings. IRM 2500 requires that software documentation be consistent with the Yourdon, Constantine, and Demarco methodology, which we were told has been in use in IRS for about 10 years. However, it does not explicitly state that this methodology be used. Also, our review of the request for proposals showed that it mentioned this method as an example, but did not specifically require its use.

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[2]Other vendors, including the one who raised the question, also withdrew from competition after the request for proposals was amended, but they did so for other reasons. None of the vendors protested the request for proposals.

[3]FIPS PUBS are the official government publications relating to standards and guidelines for improving the utilization and management of computer and related telecommunications systems in the federal government. They are promulgated by the National Institute of Standards and Technology of the Department of Commerce.

Software Documentation Requirement Did Not Improperly Limit Competition

The requirement to document all software developed specifically for CHEXS in accordance with IRM 2500 did not improperly restrict competition. IRS is justified in requiring that all application software that it expects to maintain conform to IRM 2500. According to IRS, it is easier for IRS programmers to maintain software when the documentation meets prescribed, agencywide standards. IRS also stated that in the past it has had problems in maintaining software supplied by contractors that was not documented in accordance with IRM 2500. We also have reported problems encountered by IRS due to inadequately documented software. For example, in our July 1990 report, we noted that the schedule for developing IRS' Automated Underreporter System slipped by almost a year because IRS (1) waived compliance with its software documentation standards for analysis and design and (2) issued a request for proposals that was based on software that was not documented in accordance with IRS software documentation standards.[4] With specific regard to the CHEXS procurement, our review of the request for proposals showed that CHEXS will be a relatively complex system that will require complex software. System documentation is necessary to help maintain and enhance the system as IRS users' needs change. In our view, it would be unwise for IRS to acquire any software that it expects to maintain that is not documented in accordance with agency standards.

Other Solicitations Have Not Made the Documentation Requirement Explicit

IRS officials told us that the requirement that software be documented in conformance with IRM 2500 is included in each request for proposals that is expected to result in the delivery of application software. We reviewed the requests for proposals for several recent procurements and found that this requirement was included. However, we found that none of the requests for proposals, including those issued after the CHEXS solicitation was clarified, explicitly state that all software, including off-the-shelf and pre-existing software for which IRS expects to assume maintenance responsibility, be documented in conformance with IRM 2500. For example, the request for proposals which was issued on June 28, 1991, for another Tax Systems Modernization system, the Document Processing System, stated that custom-developed software shall be developed in accordance with software development standards as described in IRM 2500,

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[4]Tax System Modernization: Management Mistakes Caused Delays in Automated Underreporter System (GAO/IMTEC-90- 51, July 10, 1990).

but did not state that all software for which IRS might assume maintenance responsibility conform to the requirements of IRM 2500.[5] It also did not contain the specific requirement included in the CHEXS request for proposals that all pre-existing software that will be maintained by IRS be documented in conformance with IRM 2500.

Conclusions

Because IRS has a sound basis for requiring that all application software to be maintained by the agency, including off-the-shelf and pre-existing software, be documented in conformance with IRM 2500, IRS' clarification of this requirement did not improperly restrict competition. However, even though the requirement has been clarified, it has not been made explicit in other requests for proposals. This lack of clarity could be a source of problems, or even protests, in future procurements.

Recommendation to the Commissioner of Internal Revenue

We recommend that the Commissioner of Internal Revenue amend the Service's contracting procedures to require that all future solicitations clearly indicate that the software documentation requirements apply to all software for which IRS expects to assume maintenance responsibility, including pre-existing and off-the-shelf software.

Agency Comments

In its February 3, 1992, comments on our report, IRS stated that it agreed with our recommendation. The agency also provided several technical comments on the report, which we have incorporated as appropriate. The full text of IRS' comments is contained in appendix II.

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[5] In commenting on our report, IRS stated that it is not the agency's intention to assume responsibility for maintaining commercial off-the-shelf software. However, off-the-shelf software that has been modified for a specific IRS application, such as the Document Processing System, would be required to conform with IRM 2500.

We performed our review between July and December 1991, in accordance with generally accepted government auditing standards. As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the date of this letter. We will then send copies to the Secretary of the Treasury; the Commissioner of Internal Revenue; the Director, Office of Management and Budget; and interested congressional committees. Copies will also be made available to others upon request. This report was prepared under the direction of Howard G. Rhile, Director, General Government Information Systems, who can be reached at (202) 336-6418. Other major contributors are listed in appendix II.

Sincerely yours,

Ralph V. Carlone
Assistant Comptroller General

Objectives, Scope, and Methodology

We reviewed the Check Handling Enhancements and Expert Systems (CHEXS) procurement to determine whether a software documentation requirement included in the request for proposals was justified and whether it restricted competition.

We reviewed and analyzed the request for proposals to determine whether the software documentation requirement was clearly stated, and we reviewed IRS' software documentation requirement to determine if it was reasonable. We also discussed the requirement with IRS officials, and reviewed documentation obtained from IRS concerning the reasons for the requirement and IRS' analysis of the effect of the requirement on vendors' proposals. In addition, we interviewed the vendor who questioned the requirement, and discussed with other vendors the reasons why they did not submit contract proposals.

We performed our work at IRS headquarters in Washington, D.C., and at IRS locations in Falls Church and Rosslyn, Virginia. The vendor we interviewed was located in the Washington, D.C. area. We provided a draft of our report to IRS for comment, and the agency provided written comments on our findings, conclusions, and recommendations. Their comments were incorporated into the report as appropriate.

Comments From the Internal Revenue Service

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224

DEPUTY COMMISSIONER

FEB - 3 1992

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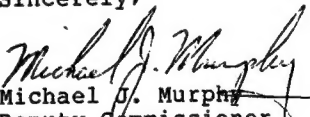IMTEC--Techworld, Rm. 10028
Washington, DC 20548

Dear Mr. Carlone:

Thank you for the opportunity to review your recent draft report entitled, "IRS Procurement: Software Documentation Requirement Did Not Restrict Competition" (IMTEC-92-30).

We agree with the report recommendation to amend the Service's contracting procedures to require that all future solicitations clearly indicate that the software documentation requirements apply to all software for which IRS expects to assume maintenance responsibility, including off-the-shelf software. However, we have enclosed comments to correct minor technical errors on other aspects of the report text. We hope you find these comments useful.

Best regards.

Sincerely,

Michael J. Murphy
Deputy Commissioner

Enclosure

IRS COMMENTS ON GAO DRAFT REPORT ENTITLED
"IRS PROCUREMENT: SOFTWARE DOCUMENTATION
REQUIREMENT DID NOT RESTRICT COMPETITION"

Issue 1:   The effect of the referenced Amendment 4 to the
request for proposals (page 4 of the draft report) was not, as
stated in the draft report, "to require that off-the-shelf and
pre-existing software be documented in accordance with IRM 2500."
Rather, it clarified that the IRS would require this type of
documentation for application software specifically developed for
the Check Handling Enhancements and Expert Systems (CHEXS), and
for any other application software which its programmers might
otherwise maintain once they assumed application software support
responsibilities.

Issue 2:   The draft report states (page 6) that, "The
requirement to document all software in accordance with IRM 2500
did not improperly restrict competition.   IRS is justified in
requiring that all application software that it expects to
maintain conform to IRM 2500."   The Request for Proposal (RFP),
as amended, did not have the effect of requiring that all
software be documented in accordance with IRM 2500.

Issue 3:   GAO indicated (page 8) that the Document
Processing System (DPS) RFP, issued June 28, 1991, "did not state
that all software which IRS might assume maintenance
responsibility conform to the requirements of IRM 2500."

All software developed for DPS (whether it be custom
software, or off-the-shelf software which has been modified in
some way for use by DPS) is required to be developed in
conformance with IRM 2500 and other IRS, Federal Information
Processing Standards, and ANSI standards.   The operative words in
this description are "software developed for DPS."   Unmodified
off-the-shelf is not by definition, "software developed for DPS."

Commercial off-the-shelf software that has been modified in
any way for use by DPS falls into the category "software
developed for DPS" (i.e., if it has been modified, it is no
longer "off-the-shelf").

Although the government reserves the option to assume the
responsibility to maintain commercial off-the-shelf software, it
is not our intention of ever doing so.   We are preparing an
amendment to the DPS RFP that will clarify this intention.   To
date this issue has not been raised by any of the prospective
vendors.

Major Contributors to This Report

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